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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,766	12/28/2001	Satoshi Shimizu	216780US-2 DIV	4292

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EXAMINER

NGUYEN, CUONG QUANG

ART UNIT PAPER NUMBER

2811

DATE MAILED: 05/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,766

Applicant(s)

SHIMIZU ET AL.

Examiner

Cuong Q Nguyen

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 10-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 10-11 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support for "first side walls being higher than said gate electrode from said silicon substrate" wherein the gate electrode includes "a silicide on a surface of said silicon film" in original specification or in the drawings. It is noted that, the Fig.29 of present invention shown the first side walls (41) has the same height with the silicide film (45), so the side walls are not higher than said gate electrode (which includes the silicide film) from said silicon substrate as claimed.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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It is unclear which surface is preferred to "a plane portion" while the gate electrode includes two surfaces (the surface of silicon layer and the surface of silicide layer).

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mathews et al. in view of Mogami (US 5,656,519).

Mathews et al. discloses a MIS transistor device comprising: a silicon substrate (15) having a main surface; a gate insulating film (16) formed on the substrate; a gate electrode (11) formed on the gate insulating film and having a silicified portion (12) at an opposite side of gate insulating film; a pair sidewalls formed on the main surface on both sides of gate electrode and having L-shape sections (42) being higher than the silicified portion (12); and impurity regions (source/drain regions 44) formed inside the main surface to be opposed to gate electrode in regard to sidewalls. See Mathews et al.'s Fig.1.

Mathews et al. does not teach that source/drain regions have a silicified surface.

Mogami discloses a MIS transistor comprising: source/drain regions (10 and 11) having silicified surfaces (13b). See Mogami's Fig.5F.

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It would have been obvious to one of ordinary skill in the art to form source/drain regions including silicified surface as taught by Mogami into Mathews et al.'s device in order to reduce the parasitic resistances of the source/drain regions of MIS transistor. See Mogami's col.1 lines 23-30.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mathews et al. in view of Mogami and further in view of Lur et al. (US 5,554,566).

Mathews et al. and Mogami teaches all limitations of claim 10 as shown above, However, Mathews et al. and Mogami do not teach that a surface of the gate electrode being roughened.

Lur et al. discloses a transistor device comprises a surface (6B) of a gate electrode (4) having a roughness surface. See Lur et al.'s Fig.2.

It would have been for one ordinary skill in the art to incorporate the gate electrode having a roughness surface as taught by Lur et al. into device being formed by the combination of Mathews et al. and Mogami in order to improve adhesion (reducing peeling phenomena) between the poly gate and the silicide layer. This rough surface also allows a less stress interface to be produced. See Lur et al.'s col.2 lines 1-8.

Response to Arguments

4. Applicant's arguments with respect to claims 10-11 have been considered but are moot in view of the new ground(s) of rejection (112 rejections).

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5. Applicant's arguments with respect to claims 12-13 have been considered but are not persuasive.

Applicants argue that the teachings in Mogami can not be incorporated in Mathews et al. because in Mathews et al. only the gate (11) is silicified. In response, the rejection is based on a combination of Mathews et al. and Mogami; Mathews et al. teaches all limitations of claims except the upper surface of source/drain region are silicified, while Mogami teaches the surfaces of source/drain regions being silicified surface in order to reduce the parasitic resistances of the source/drain regions of MIS transistor (Mogami's col.1 lines 23-30). It is noted that, one of ordinary skill in the art can form the silicide on the surface of source/drain regions the same time as forming the silicide layer on the gate as taught by Mogami or can form the silicide layer on source/drain regions after forming the gate electrode structure because the method limitations how to form the device are not considered as patentability limitations in the device application and one of ordinary skill in the art can use any method to incorporate the silicide layer as taught by Mogami on Mathews et al.'s source/drain regions.

Conclusion

6. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via th

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TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

7. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is (703) 308-1293. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor TOM THOMAS who can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722 or 308-7724.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center Receptionists whose telephone number is 308-0956.


Cuong Nguyen

Primary examiner

April 30, 2003